CLAIMS:

1. A method of manufacturing a nanotube growing mat comprising:

   providing a substrate including carbon;

   applying nanosized catalytic particles on the substrate in a predetermined pattern, the pattern promoting growth in an organized manner from the catalytic particles as a function of the pattern.

2. The method of claim 1, wherein the substrate is porous.

3. The method of claim 1, wherein the substrate includes a patterned monolayer of carbon nano- or micro-particles.

4. The method of claim 3, wherein the substrate comprises non-carbon elements selected from the group consisting of Si, N, and P, to produce a hetero-substrate.

5. The method of claim 4, wherein substrate and the hetero-substrate are placed in a multilayer configuration.

6. The method of claim 4, wherein the hetero-substrate contains Si which is incorporated into the nanotube produced on the mat and produces a hetero-nanotube with carbon and silicon.

7. The method of claim 5, wherein the multilayer configuration produces a complex nanotube comprising carbon and silicon in alternating layers.

8. The method of claim 1, wherein the catalytic particles are a metal.

9. The method of claim 8, wherein the catalytic particles are deposited in a monolayer.

10. The method of claim 8, wherein the metal is selected from the group consisting of Fe, Co, Ni, Y, Mo and their alloys.

11. The mat of claim 10, wherein the nanosized catalytic particles are applied on the carbon substrate by a method selected from the group consisting of transmission electron microscopy, monolayer generator 1 method, Langmuir-Blodgett, apparatus producing Langmuir-Blodgett films and Dynamic Thin Laminar Flow.

12. The mat of claim 11, wherein the method is the monolayer generator 1 method.

13. A method of producing organized nanotubes comprising:

preparing a nanotube growing mat comprising:

a substrate including carbon; and

nanosized catalytic particles on the substrate, wherein the catalytic particles are applied in a predetermined pattern on the substrate, the pattern promoting growth of nanotubes in an organized manner which is a function of the pattern;

activating the mat; and

flowing a carrier gas in a direction whereby the nanotubes are produced from the mat on a continuous basis.

14. The method of claim 13, wherein the substrate is porous.

15. The method of claim 12, wherein the substrate includes a patterned monolayer of carbon nano- or micro-particles.

16. The method of claim 15, wherein the substrate comprises non-carbon elements selected from the group consisting of Si, N, and P, to produce a hetero-substrate.

17. The method of claim 16, wherein substrate and the hetero-substrate are placed in a multilayer configuration.

18. The method of claim 16, wherein the hetero-substrate contains Si which is incorporated into the nanotube produced on the mat and produces a hetero-nanotube with carbon and silicon.

19. The method of claim 17, wherein the multilayer configuration produces a complex nanotube comprising carbon and silicon in alternating layers.

20. The method of claim 13, wherein the carrier gas comprises a carbon source, a hydrogen source and an inert gas.

21. The method of claim 20, wherein the inert gas is selected from the group consisting of He, Ne, Ar, Kr, and Xe.

22. The method of claim 21, wherein the inert gas is Ar.

23. The method of claim 13, wherein in the nanotubes are gathered and drawn away from the mat by an anchorage device or a negative pressure.

24. The method of claim 23, wherein the nanotubes are gathered by a negative pressure.

25. The method of claim 13, wherein activating the mat is achieved by applying an electric current across the mat.

26. The method of claim 13, wherein the catalytic particles are a metal.

27. The method of claim 26, wherein the catalytic particles are deposited in a monolayer.

28. The method of claim 27, wherein the metal is selected from the group consisting of Fe, Co, Ni, Y, Mo and their alloys.

29. A nanotube growing mat comprising:

a substrate including carbon;

nanosized catalytic particles, wherein the set is applied on the substrate in a predetermined pattern which promotes growth of nanotubes from the catalytic particles as a function of the pattern.

30. The mat of claim 29, comprising an electrical connection.

31. The mat of claim 29, wherein the substrate is porous.

32. The mat according to claim 29, wherein the substrate includes a patterned monolayer of carbon nano- or micro-particles.

33. The mat of claim 32, wherein the carbon substrate comprises non-carbon elements selected from the group consisting of Si, N, and P, to produce a hetero-substrate.

34. The mat of claim 33, wherein carbon substrate and the hetero-substrate are placed in a multilayer configuration.

35. The mat of claim 34, wherein the hetero-substrate contains Si which is incorporated into the nanotube produced on the mat and produces a hetero-nanotube with carbon and silicon.

36. The mat of claim 34, wherein the multilayer configuration produces a complex nanotube comprising carbon and silicon in alternating layers.

37. The mat of claim 29, wherein the carrier gas comprises a carbon source, a hydrogen source and an inert gas.

38. The mat of claim 37, wherein the inert gas is selected from the group consisting of He, Ne, Ar, Kr, and Xe.

39. The mat of claim 38, wherein the inert gas is Ar.

40. The mat of claim 29, wherein in the nanotubes are gathered and drawn away from the mat by an anchorage device or a negative pressure.

41. The mat of claim 40, wherein the nanotubes are gathered by a negative pressure.

42. The mat of claim 29, wherein activating the mat is achieved by applying an electric current across the mat.

43. The mat according to claim 29, wherein the catalytic particles are a metal.

44. The mat according to claim 43, wherein the catalytic particles are deposited in a monolayer.

45. The mat according to claim 44, wherein the metal is selected from the group consisting of Fe, Co, Ni, Y, Mo and their alloys.

46. The mat according to claim 29, wherein the nanosized catalytic particles are deposited on the carbon substrate by a method selected from the group consisting of transmission electron microscopy, monolayer generator 1 method, Langmuir-Blodgett, apparatus producing Langmuir-Blodgett films and Dynamic Thin Laminar Flow.

47. The mat according to claim 46, wherein the method is the monolayer generator 1 method.